Claims

1. A multistage propylene-based polymer comprising the following components (A) and (B):

(A) 5 to 20 wt% of a propylene homopolymer component or a copolymer component of propylene and an α-olefin with 2 to 8 carbon atoms having an intrinsic viscosity [η] of more than 10 dL/g in tetralin at 135°C; and

(B) 80 to 95 wt% of a propylene homopolymer component or a copolymer component of propylene and an α-olefin with 2 to 8 carbon atoms having an intrinsic viscosity [η] of 0.5 to 3.0 dL/g in tetralin at 135°C.

2. The multistage propylene-based polymer according to claim 1 comprising 8 to 18 wt% of the (A) component and 82 to 92 wt% of the (B) component .

3. The multistage propylene-based polymer according to claim 1 of which the melt flow rate is 100 g/10 min or less at 230°C,

the melt flow rate (MFR) at 230°C and the melt tension (MT) at 230°C thereof satisfying the following relationship (1).

$$\log(MT) > -1.33\log(MFR) + 1.2 \qquad (1)$$

4. The multistage propylene-based polymer according to claim 1 wherein the ratio of the storage modulus G'(10) at an

angular frequency of 10 rad/s to the storage modulus G'(1) at an angular frequency of 1 rad/s, G'(10)/G'(1), is 2 or more; and

the ratio of the storage modulus G'(0.1) at an angular frequency of 0.1 rad/s to the storage modulus G'(0.01) at an angular frequency of 0.01 rad/s, G'(0.1)/G'(0.01), is 6 or less.

5. A method for producing the multistage propylene-based polymer of any one of claims 1 to 4 comprising:

polymerizing propylene, or

copolymerizing propylene and an α-olefin with 2 to 8 carbon atoms

by using an olefin polymerization catalyst comprising the following components (a) and (b), or (a), (b), and (c) in 2 or more polymerization stages:

(a) a solid catalyst component obtainable by treating titanium trichloride with an ether compound and an electron acceptor, the titanium trichloride being obtainable by reducing titanium tetrachloride with an organoaluminum compound;

(b) an organoaluminum compound; and

(c) a cyclic ester compound.

6. The method for producing the multistage propylene-based polymer of claim 5 comprising:

producing a propylene homopolymer component or a copolymer component of propylene and an α-olefin with 2 to 8 carbon atoms having an intrinsic viscosity [η] of more than 10

dL/g in tetralin at 135°C in an amount of 5 to 20 wt% of the polymer in the first polymerization stage, and

producing a propylene homopolymer component or a copolymer component of propylene and an α-olefin with 2 to 8 carbon atoms having an intrinsic viscosity [η] of 0.5 to 3.0 dL/g in tetralin at 135°C in an amount of 80 to 95 wt% of the polymer in the second polymerization stage.

7. A propylene-based resin composition comprising:

the multistage propylene-based polymer of claim 1, and

a propylene-based polymer having a melt flow rate of 30 g/10 min or less at 230°C and a ratio of weight average molecular weight (Mw) to number average molecular weight (Mn) of 5 or less,

the weight ratio of the propylene-based polymer to the multistage propylene-based polymer being eight times or more.

8. The propylene-based resin composition according to claim 7, wherein the ratio of the storage modulus G'(10) at an angular frequency of 10 rad/s to the storage modulus G'(1) at an angular frequency of 1 rad/s, G'(10)/G'(1), is 5 or more; and

the ratio of the storage modulus G'(0.1) at an angular frequency of 0.1 rad/s to the storage modulus G'(0.01) at an angular frequency of 0.01 rad/s, G'(0.1)/G'(0.01), is 14 or less.

9. A propylene-based resin composition comprising the following component (1), and any one of the following components

(2), (3), and (4):

(1) 100 parts by weight of the multistage propylene-based polymer of claim 1,

(2) 0.1 to 10 parts by weight of a powdery or fibrous porous filler,

(3) 0.05 to 1.0 parts by weight of a chemical foaming agent, and

(4) 0.05 to 1.0 parts by weight of a crystallization nucleating agent.

10. The propylene-based resin composition according to claim 9, wherein the porous filler is silica, activated carbon, zeolite or silica gel having an average particle diameter of 50 μm or less, or fibrous activated carbon having a fiber diameter of 20 μm or less.

11. A formed product obtainable by foam-molding the multistage propylene-based polymer of claim 1 or the propylene-based resin composition of claim 7.

12. The formed product according to claim 11 which is an injection foam-molded product having an expansion ratio of 1.1 to 80 times, the product being obtainable by injection foam-molding using a supercritical carbon dioxide or supercritical nitrogen.

13. The formed product according to claim 11 which is an

extrusion foam-molded product having an expansion ratio of 1.1 to 80 times.

14. A composite material comprising the multistage propylene-based polymer of claim 1 or the propylene-based resin composition of claim 7, and at least one material selected from fibers, fillers and rubbers.